



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/520,755	01/10/2005	Ralf Landgraf	18501	5061
272 7590 10/27/2009 SCULLY, SCOTT, MURPHY & PRESSER, P.C. 400 GARDEN CITY PLAZA SUITE 300 GARDEN CITY, NY 11530				
EXAMINER				
BERMAN, JASON				
ART UNIT		PAPER NUMBER		
1795				
MAIL DATE		DELIVERY MODE		
10/27/2009		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/520,755

**Applicant(s)**

LANDGRAF ET AL.

**Examiner**

Jason M. Berman

**Art Unit**

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 June 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 17-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 17-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/US)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Status of the Claims***

Claims 17-28 are pending in the current application.

### ***Response to Amendment***

Applicant's amendment of 6/10/2009 does not render the application allowable.

### ***Status of the Rejections***

The rejection of claims 23-28 has been withdrawn in view of Applicant's amendment. New grounds of rejection under 35 U.S.C. 103(a) are necessitated by the amendments.

All other rejections from the previous office action are maintained.

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 17-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saunders (US 5,531,876) in view of Ueda (JP 2002155356, cited in IDS as WO 02/20866).

As to claim 17, Saunders discloses a target support assembly comprising:

- A support sleeve on which is arranged a target sleeve (Figure 2: support 15 for target 12);
- A plurality of elastically-active clamping elements being distributed between the sleeves arranged in a respective external recess in the support sleeve (figure 2: showing clamp 16 in recess);
- Each clamping element having a portion press-fitted in the associated recess and possessing a radially extending portion in clamping contact with the internal surface of the target sleeve (figure 2: showing shape of clamps 16 and 17);
- The clamping elements each comprising an elastically deformable, electrically and thermally conductive material (col 3 lines 16-19: clips are BeCu alloy; both beryllium and copper are inherently good thermal and electrical conductors);
- Each clamping element being an angled leaf spring having the portion forming a base arm extending along the bottom of the recess with the base arm having opposite ends wedged between the sidewalls of the recess (figure 2: showing spring clips deforming to clamp target to backing plate); and

- A clamping arm of the clamping element extending radially angled outwardly from the recess and the arm having a free end forming an outwardly curvilinear portion for clampingly contacting the oppositely located surface of the target sleeve (figure 2: showing spring clips deforming to clamp target to backing plate).

Saunders, while disclosing a clamping element for a support sleeve and target, is silent as to the structure being cylindrical in nature.

Ueda discloses a sleeve and cylindrical support sleeve with a target lining (figure 4: target 20 with lining 52 and support sleeve 16). Elastic clamping and sealing elements are also present in the apparatus of Ueda in a recess between the support and target and the arrangement is designed to allow easy replacement of the target (figure 7: elastic rings 53; English translation abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the clamping elements of Saunders in a cylindrical target and support sleeve arrangement of Ueda, because the clamps of Saunders effectively allow the target to be held removable in place (Saunders at abstract).

As to claim 18, Saunders discloses a target support assembly comprising:

- A support sleeve on which is arranged a target sleeve (Figure 2: support 15 for target 12 on electrode 4);
- A plurality of elastically-active clamping elements being distributed between the sleeves arranged in a recess (figure 2: showing clamp 16 in recess);

- Each clamping element having a portion press-fitted in the associated recess and possessing a radially extending portion in clamping contact with the internal surface of the target sleeve (figure 2: showing shape of clamps 16 and 17);
- The clamping elements each comprising an elastically deformable, electrically and thermally conductive material (col 3 lines 16-19: clips are BeCu alloy; both beryllium and copper are inherently good thermal and electrical conductors);
- Each clamping element being an angled leaf spring having the portion forming a base arm extending along the bottom of the recess with the base arm having opposite ends wedged between the sidewalls of the recess (figure 2: showing spring clips deforming to clamp target to backing plate); and
- A clamping arm of the clamping element extending radially angled outwardly from the recess and the arm having a free end forming an outwardly curvilinear portion for clampingly contacting the oppositely located surface of the support sleeve (figure 2: showing spring clips deforming to clamp target to backing plate).

Saunders, while disclosing a clamping element for a support sleeve and target, is silent as to the structure being cylindrical in nature.

Ueda discloses a sleeve and cylindrical support sleeve with a target lining (figure 4: target 20 with lining 52 and support sleeve 16). Elastic clamping and sealing

elements are also present in the apparatus of Ueda in a recess between the support and target and the arrangement is designed to allow easy replacement of the target (figure 7: elastic rings 53; English translation abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the clamping elements of Saunders in a cylindrical target and support sleeve arrangement of Ueda, because the clamps of Saunders effectively allow the target to be held removable in place (Saunders at abstract). It is noted that Saunders discloses the recesses to be on the external recesses of the sleeves, rather than the internal surface. It would have been obvious to one of ordinary skill to use an internal surface of the target for the recess since such an arrangement would have the same ultimate clamping effect and would therefore only require routine skill in the art to rearrange the orientation of the clamps.

As to claim 19, Saunders discloses the clamping elements have rounded insertion edges on both sides in an axial direction (figure 2: clamping elements 16 and 17 having entirely rounded structure along clamping edges).

As to claim 20, Saunders discloses the clamping elements have a clamping arm that exerts clamping pressure with the free end of the arm (figure 2: showing clamping elements 16 and 17 with free end pressed between sidewall and targets 11 and 12).

As to claim 21, Saunders discloses an insertion segment is arranged at the free end of the clamping arm and forms a rounded shaped element with the clamping arm (figure 2: clamping elements 16 and 17 having entirely rounded structure along clamping edges).

As to claim 22, Saunders discloses the free end of the insertion segment is supported in opposition to the clamping pressure of the clamping position thereof (figure 2: showing rounded clamping end of clamping elements 16 and 17 supported against recess wall opposite target 11 and 12).

4. Claims 23-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueda in view of Ikeda (JP 01193463 A) and Morgan (US 5,591,314).

As to claim 23, Ueda discloses a target assembly comprising:

- A cylindrical support sleeve on which is arranged a target lining formed by a cylindrical target sleeve (figure 7: showing target 20 with lining 52 and support 16);
- Wherein a plurality of elastically active clamping elements distributed between the facing circumference of the sleeves are arranged in a respective recess of a plurality of recesses formed in the external surface of the support sleeve (figure 7: showing recesses in lining 52 for rings 53);
- Each clamping element having a portion located in the recess and a radially projecting portion in clamping contact with the internal cylindrical surface of the target-sleeve (figure 7: showing ring 53 compressed between target 20, lining 52 and backing plate 16);
- The clamping elements comprising an elastically compressible material in a ring-shaped tubular member of hollow cross-section (figure 7: ring shaped element 53);



- The element extending along a curved bottom of the recess and between the sidewalls of the recess forming a clamping surface extending radially outwardly of the recess (figure 7); and
- The element having a curvilinear shape for clampingly contacting the oppositely located surface of the target sleeve (figure 7: showing o-ring elements 53).

Ueda is silent as to the clamping element being electrically and thermally conductive and the recess being convexly rounded.

Ikeda discloses a sealing mechanism for a coating chamber in which multiple elastic o-ring are provided in a recess as a clamping means to vacuum seal the two components (English translation abstract; figures 1 and 2). Ikeda also discloses the o-ring is conductive to prevent leaking of the electric signals (English translation abstract).

Morgan discloses the use of an O-ring in a sputtering apparatus in which the groove containing the O-ring is rounded to allow for greater surface contact between the O-ring and groove (figure 2: showing surface 56 rounded for o-ring 40; col 5 lines 55-60).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a conductive o-ring clamping element, as disclosed by Ikeda, in the apparatus of Ueda, because a conductive O-ring will improve electrical and thermal contact between the target and backing plate. Additionally, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide a rounded recess for the o-ring, as disclosed by Morgan, in the apparatus of Ueda in view

of Ikeda, because this will allow for greater contact area between the o-ring and groove. One of ordinary skill will recognize the benefit of greater contact as allowing for greater electrical and thermal conduction (air is an insulator).

As to claim 24, Ueda discloses a target assembly comprising:

- A cylindrical support sleeve on which is arranged a target lining formed by a cylindrical target sleeve (figure 7: showing target 20 with lining 52 and support 16);
- Wherein a plurality of elastically active clamping elements distributed between the facing circumference of the sleeves are arranged in a respective recess of a plurality if recessed formed in the internal surface of the target sleeve (figure 7: showing recesses in target 20 for rings 53);
- Each clamping element having a portion located in the recess and a radially projecting portion in clamping contact with the external cylindrical surface of the support-sleeve (figure 7: showing ring 53 compressed between target 20, lining 52 and backing plate 16);
- The clamping elements comprising an elastically compressible material in a ring-shaped tubular member of hollow cross-section (figure 7: ring shaped element 53);
- The element extending along a curved bottom of the recess and between the sidewalls of the recess forming a clamping surface extending radially outwardly of the recess (figure 7); and

- The element having a curvilinear shape for clampingly contacting the oppositely located surface of the target sleeve (figure 7: showing o-ring elements 53).

Ueda is silent as to the clamping element being electrically and thermally conductive and the recess being convexly rounded.

Ikeda discloses a sealing mechanism for a coating chamber in which multiple elastic o-ring are provided in a recess as a clamping means to vacuum seal the two components (English translation abstract; figures 1 and 2). Ikeda also discloses the o-ring is conductive to prevent leaking of the electric signals (English translation abstract).

Morgan discloses the use of an O-ring in a sputtering apparatus in which the groove containing the O-ring is rounded to allow for greater surface contact between the O-ring and groove (figure 2: showing surface 56 rounded for o-ring 40; col 5 lines 55-60).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a conductive o-ring clamping element, as disclosed by Ikeda, in the apparatus of Ueda, because a conductive O-ring will improve electrical and thermal contact between the target and backing plate. Additionally, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide a rounded recess for the o-ring, as disclosed by Morgan, in the apparatus of Ueda in view of Ikeda, because this will allow for greater contact area between the o-ring and groove. One of ordinary skill will recognize the benefit of greater contact as allowing for greater electrical and thermal conduction (air is an insulator).

As to claim 25, Ueda discloses the clamping element has a rounded shape (figure 7: showing o-ring 53).

As to claim 26, Ueda discloses the clamping element and recess have an annular configuration (figure 7: showing recess and o-ring 53 as annular ring in target/backing plate structure).

As to claim 27, Ueda discloses the recess is a groove in the circumferential direction on the cylindrical sleeve (figure 7: showing o-rings 53 as circumferential ring in circumferential recess [cross section shown]).

As to claim 28, Ueda discloses the length of the support sleeve is greater than the target sleeve and at least one annular limiting part is fixed detachably on the support sleeve at both ends of the target sleeve (figure 7: showing backing plate 16 extending a greater distance than target 20 with removable o-rings 53 situated at each end of target 20).

### ***Response to Arguments***

5. Applicant argues on page 9-10 of the remarks that Saunders, either alone or in combination with Ueda, does not disclose an angled leaf spring in which the base arm is wedged between walls of the recess. The spring clips of Saunders, as illustrated in figure 2, are shown as wedged between 2 of the walls of the recess (col 3 lines 16-19: "Several spring clips... engage shoulders 18, 19... and thus hold these plates with pretension against electrode 4"). The O-ring of Ueda additionally is illustrated as being pressed against at least 3 walls of the recess which contains the ring (figure 7). It is therefore unclear why one of ordinary skill in the art would not design an elastic

camping element which is wedged or pressed against the walls of its recess in view of Saunders and Ueda.

6. In response to applicant's argument on page 10 that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Applicant argues that the spring clips of Saunders would not be usable within a cylindrical target design and asserts that the clips of Saunders would break in a cylindrical design. No limitation to planar targets is made within Saunders and one of ordinary skill would recognize that the clips "which are able to grip around projections on the backing plate" and allow for "the target or segments of a target to be replaced without tools" could be used, even with slight modification as required, in a cylindrical design, such as that of Ueda.

7. Applicant argues on pages 11-14 of the remarks that the claim limitation of "the recess being convexly rounded is not disclosed by Ueda nor Ikeda. Although both these references illustrate their respective grooves as being rectangular, one of ordinary skill would recognize that when specifically using a conductive ring member, as disclosed by Ikeda, the purpose of the conductive member would be defeated if contact between the conductive member and surrounding parts is not ensured. Air is a poor

conductor of both heat and electricity. Additionally, as discussed in the above rejections, Morgan discloses that it is known in the art to round a recess to allow for greater contact area between an o-ring and its corresponding groove.

### ***Conclusion***

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M. Berman whose telephone number is (571)270-5265. The examiner can normally be reached on M-R 8am-5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571)272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nam X Nguyen/  
Supervisory Patent Examiner, Art Unit 1753

/J. M. B./  
Examiner, Art Unit 1795  
10/27/2009